

What is claimed is:

1. A method of manufacturing a semiconductor integrated circuit device performed in a semiconductor manufacturing apparatus having a plurality of chambers, comprising the steps
5 of:

(a) obtaining a flat entire image of a semiconductor wafer after performing a first process to said semiconductor wafer in a first chamber of said plurality of chambers and before performing a second process to said semiconductor wafer in a
10 second chamber of said plurality of chambers;

(b) determining the condition of said semiconductor wafer by examining said flat entire image of the semiconductor wafer;
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(c) transporting said semiconductor wafer to said second
15 chamber and performing said second process to said semiconductor wafer when said semiconductor wafer is determined to be in proper condition in said step (b); and

(d) stopping the operation of said semiconductor manufacturing apparatus when said semiconductor wafer is
20 determined to be in improper condition in said step (b).

2. The method of manufacturing a semiconductor integrated circuit device according to claim 1, wherein, in said step (b), the condition of said semiconductor wafer is determined by comparing a flat entire image of a good semiconductor wafer recorded in advance and said flat entire image of said semiconductor wafer obtained in said step (a).
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3. The method of manufacturing a semiconductor integrated circuit device according to claim 1, wherein said first

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process includes a heat treatment method, a physical deposition method, a chemical deposition method, and a dry etching.

4. A method of manufacturing a semiconductor integrated

5 circuit device using a semiconductor manufacturing apparatus having a plurality of chambers, comprising the steps of:

(a) transporting a semiconductor wafer to a first chamber of said plurality of chambers, and then performing a first process to said semiconductor wafer;

10 (b) photographing a flat entire image of said semiconductor wafer by a photographing unit after taking out said semiconductor wafer from said first chamber, and setting the photographed flat entire image as a first image;

(c) taking said first image in a discrimination unit and comparing a flat entire image of a good semiconductor wafer recorded in advance with said first image, thereby determining the presence of the damages on said semiconductor wafer;

(d) stopping the operation of said semiconductor manufacturing apparatus when it is determined that said

20 semiconductor wafer is damaged in said step (c); and

(e) transporting said semiconductor wafer to said second chamber and performing a second process to said semiconductor wafer when it is determined that said semiconductor wafer is not damaged in said step (c).

25 5. The method of manufacturing a semiconductor integrated circuit device according to claim 4, wherein said first image is displayed by a series of gradual stages of color.

6. The method of manufacturing a semiconductor integrated

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circuit device according to claim 4, wherein said first process includes a heat treatment method, a physical deposition method, a chemical deposition method, and a dry etching.

5 7. A method of manufacturing a semiconductor integrated circuit device using a semiconductor manufacturing apparatus having a plurality of chambers, comprising the steps of:

(a) transporting a semiconductor wafer to a first chamber of said plurality of chambers, and performing a heat treatment

10 to a first surface of said semiconductor wafer or forming a first thin film on the first surface of said semiconductor wafer;

(b) photographing a flat entire image of said semiconductor wafer by a photographing unit after taking out said semiconductor wafer from said first chamber, and setting the photographed flat entire image as a first image;

(c) taking said first image in a discrimination unit and comparing a flat entire image of a good semiconductor wafer recorded in advance with said first image, thereby determining

20 whether the position of said heat treatment applied to or that of said first thin film formed on said first surface is proper or improper; and

(d) stopping the operation of said semiconductor manufacturing apparatus when it is determined in said step (c)

25 that said position of said heat treatment applied to or that of said first thin film formed on said first surface of said semiconductor wafer is displaced from a predetermined position.

8. A method of manufacturing a semiconductor integrated

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circuit device using a semiconductor manufacturing apparatus having a plurality of chambers, comprising the steps of:

(a) transporting a semiconductor wafer to a first chamber of said plurality of chambers, and performing a heat treatment

5 to a first surface of said semiconductor wafer or forming a first thin film on the first surface of said semiconductor wafer;

(b) photographing a flat entire image of said semiconductor wafer by a photographing unit after taking out said semiconductor wafer from said first chamber, and setting the photographed flat entire image as a first image;

(c) taking said first image in a discrimination unit and comparing a flat entire image of a good semiconductor wafer recorded in advance with said first image, thereby determining whether or not said heat treatment is performed to said first surface of said semiconductor wafer or whether or not said first thin film is formed on said first surface of said semiconductor wafer; and

(d) stopping the operation of said semiconductor manufacturing apparatus when it is determined in said step (c) that said heat treatment is not performed to said first surface of said semiconductor wafer or that said first thin film is not formed on said first surface of said semiconductor wafer.

25 ^ 9. A method of manufacturing a semiconductor integrated circuit device performed in a semiconductor manufacturing apparatus in which a plurality of chambers are mechanically connected to load-lock chambers capable of storing a plurality

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of wafers via a transport chamber, comprising the steps of:

- (a) transporting a semiconductor wafer to a first chamber of said plurality of chambers through said transport chamber after taking out said semiconductor wafer from said load-lock chamber, photographing a flat entire image of said semiconductor wafer by a photographing unit before performing a first process to said semiconductor wafer, and then, setting the photographed flat entire image as a first image;
- 5 (b) taking said first image in a discrimination unit and comparing a flat entire image of a good semiconductor wafer recorded in advance with said first image, thereby determining the presence of damages on said semiconductor wafer;
- 10 (c) stopping the operation of said semiconductor manufacturing apparatus when it is determined in said step (b) that said semiconductor wafer is damaged;
- 15 (d) transporting said semiconductor wafer to said first chamber and performing said first process to said semiconductor wafer when it is determined in said step (b) that said semiconductor wafer is not damaged.

20 ^10. A method of manufacturing a semiconductor integrated circuit device performed in a semiconductor manufacturing apparatus in which a plurality of chambers are mechanically connected to load-lock chambers capable of storing a plurality of wafers via a transport chamber, comprising the steps of:

- 25 (a) photographing a flat entire image of said semiconductor wafer by a photographing unit after performing a first process to said semiconductor wafer in a first chamber of said plurality of chambers and before transporting said

semiconductor wafer to said load-lock chamber, and setting the photographed flat entire image as a first image;

(b) taking said first image in a discrimination unit and determining the presence of the damages on said semiconductor wafer by comparing a flat entire image of a good semiconductor wafer recorded in advance with said first image;

(c) stopping the operation of said semiconductor manufacturing apparatus when it is determined in said step (b) that said semiconductor wafer is damaged; and

10 (d) transporting said semiconductor wafer to said load-lock chamber when it is determined in said step (b) that said semiconductor wafer is not damaged.

15 11. A method of manufacturing a semiconductor integrated circuit device using a semiconductor manufacturing apparatus having a plurality of chambers, comprising the steps of:

(a) transporting said plurality of wafers to a predetermined number of first chambers of said plurality of chambers one by one and performing a first process to said semiconductor wafer;

20 (b) photographing a flat entire image of said semiconductor wafer by a photographing unit after taking out said semiconductor wafer from said first chamber, and setting the photographed flat entire image as a first image;

(c) taking said first image in a discrimination unit and determining the presence of the damages on said semiconductor wafer by comparing a flat entire image of a good semiconductor wafer recorded in advance with said first image; and

(d) stopping the operation of said semiconductor

manufacturing apparatus when it is determined in said step (c) that said semiconductor wafer is damaged.

12. A method of manufacturing a semiconductor integrated circuit device using a semiconductor manufacturing apparatus having a plurality of chambers, comprising the steps of:

- (a) transporting said plurality of wafers to a predetermined number of first chambers of said plurality of chambers one by one, and performing a heat treatment to a first surface of said semiconductor wafer or forming a first thin film on the first surface of said semiconductor wafer;
- (b) photographing a flat entire image of said semiconductor wafer by a photographing unit after taking out said semiconductor wafer from said first chamber, and setting the photographed flat entire image as a first image;
- (c) taking said first image in a discrimination unit and determining whether the position of said heat treatment applied to or that of said first thin film formed on said first surface is proper or improper by comparing a flat entire image of a good semiconductor wafer recorded in advance with said first image; and
- (d) stopping the operation of said semiconductor manufacturing apparatus when it is determined in said step (c) that said position of said heat treatment applied to or that of said first thin film formed on said first surface of said semiconductor wafer is displaced from a predetermined position.

13. A method of manufacturing a semiconductor integrated circuit device using a semiconductor manufacturing apparatus having a plurality of chambers, comprising the steps of:

(a) transporting a plurality of semiconductor wafers to a predetermined number of first chambers of said plurality of chambers one by one, and performing a heat treatment to a first surface of said semiconductor wafer or forming a first
5 thin film on the first surface of said semiconductor wafer;

(b) photographing a flat entire image of said semiconductor wafer after taking out said semiconductor wafer from said first chamber, and setting the photographed flat entire image as a first image;

10 (c) taking said first image in a discrimination unit and determining whether or not said heat treatment is performed to said first surface of said semiconductor wafer or whether or not said first thin film is formed on said first surface of said semiconductor wafer by comparing a flat entire image of a good semiconductor wafer recorded in advance with said first
15 image; and

(d) stopping the operation of said semiconductor manufacturing apparatus when it is determined in said step (c) that said heat treatment is not performed to said first surface of said semiconductor wafer or that said first thin film is not formed on said first surface of said semiconductor wafer.

14. A semiconductor manufacturing apparatus,

wherein a plurality of chambers and a transport chamber

25 are mechanically connected to each other; a photographing unit for obtaining a flat entire image of a semiconductor wafer, to which a predetermined process has been performed in a predetermined chamber of said plurality of chambers, is

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provided in said transport chamber; said semiconductor manufacturing apparatus has a function to determine the condition of said semiconductor wafer in proper or improper by examining said flat entire image of said semiconductor wafer;
5 and said semiconductor manufacturing apparatus has a function to stop the operation of itself when it is determined that said semiconductor wafer is in improper condition.

15. The semiconductor manufacturing apparatus according to
claim 14,

10 wherein said function to determine whether said semiconductor wafer is in proper condition or in improper condition is a function to determine whether said semiconductor wafer is in proper condition or in improper condition by comparing a flat entire image of a good semiconductor wafer recorded in advance with the flat entire image of the semiconductor wafer to which a predetermined process has been performed in said first chamber.
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16. A semiconductor manufacturing apparatus,

wherein a plurality of chambers and a transport chamber
20 are mechanically connected to each other; a photographing unit for obtaining a flat entire image of a semiconductor wafer, to which a predetermined process has been performed in a predetermined chamber of said plurality of chambers, is provided in said transport chamber; said semiconductor manufacturing apparatus has a discrimination unit to determine whether said semiconductor wafer is damaged or not by taking the flat entire image of said semiconductor wafer and comparing a flat entire image of a good semiconductor wafer
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recorded in advance with said flat entire image of said semiconductor wafer; and said semiconductor manufacturing apparatus has a function to stop the operation of itself when said discrimination unit determines that said semiconductor wafer is damaged.

5 17. The semiconductor manufacturing apparatus according to
claim 16,

wherein said discrimination unit has a function to display said flat entire image of said semiconductor wafer by 10 a series of gradual stages of color when comparing said flat entire image of said semiconductor wafer with said flat entire image of said good semiconductor wafer.

15 18. A semiconductor manufacturing apparatus,

wherein a plurality of chambers and a transport chamber are mechanically connected to each other; said transport chamber has a photographing unit for obtaining a flat entire image of a semiconductor wafer having a first surface on which a heat treatment is applied or a first thin film is formed in a predetermined chamber of said plurality of chambers; said 20 semiconductor manufacturing apparatus has a discrimination unit functioning to determine whether a position of said heat treatment or that of said first thin film on said first surface is proper or improper by taking said flat entire image of said semiconductor wafer and comparing a flat entire image of a good semiconductor wafer recorded in advance with said 25 flat entire image of said semiconductor wafer; and said semiconductor manufacturing apparatus has a function to stop the operation of itself when said discrimination unit

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determines that said position of said heat treatment or that of said first thin film on said first surface is displaced from a predetermined position.

19. A semiconductor manufacturing apparatus,

5 wherein a plurality of chambers and a transport chamber are mechanically connected to each other; said transport chamber has a photographing unit for obtaining a flat entire image of a semiconductor wafer having a first surface on which a heat treatment is applied or a first thin film is formed in a predetermined chamber of said plurality of chambers; said 10 semiconductor manufacturing apparatus has a discrimination unit functioning to determine whether or not said heat treatment is applied or whether or not said first thin film is formed on said first surface of said semiconductor wafer by taking said flat entire image of said semiconductor wafer and comparing a flat entire image of a good semiconductor wafer recorded in advance with said flat entire image of said 15 semiconductor wafer; and said semiconductor manufacturing apparatus has a function to stop the operation of itself when said discrimination unit detects that said heat treatment is 20 not applied or that said first thin film is not formed on said first surface of said semiconductor wafer.

20. A semiconductor manufacturing apparatus,

25 wherein a plurality of chambers are mechanically connected to load-lock chambers capable of storing a plurality of wafers via a transport chamber; one of said semiconductor wafers is taken out from said load-lock chamber, and then the semiconductor wafer is transported to a first chamber of said

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plurality of chambers through said transport chamber; a photographing unit for obtaining a flat entire image of said semiconductor wafer before performing a first process to said semiconductor wafer is provided; said semiconductor manufacturing apparatus has a discrimination unit functioning to determine the presence of damages on said semiconductor wafer by taking said flat entire image of said semiconductor wafer and comparing a flat entire image of a good wafer and comparing a flat entire image of a good semiconductor wafer recorded in advance with said flat entire image of said semiconductor wafer; and said semiconductor manufacturing apparatus has a function to stop the operation of itself when said discrimination unit determines that said semiconductor wafer is damaged.

21. A semiconductor manufacturing apparatus,
wherein a plurality of chambers are mechanically connected to load-lock chambers capable of storing a plurality of wafers via a transport chamber; a photographing unit for obtaining a flat entire image of said semiconductor wafer after performing a first process to a semiconductor wafer in a first chamber of said plurality of chambers and before transporting said semiconductor wafer to said load-lock chamber is provided; said semiconductor manufacturing apparatus has a discrimination unit functioning to determine the presence of damages on said semiconductor wafer by taking said flat entire image of said semiconductor wafer and comparing a flat entire image of a good semiconductor wafer recorded in advance with said flat entire image of said semiconductor wafer; and said semiconductor manufacturing

apparatus has a function to stop the operation of itself when said discrimination unit determines that said semiconductor wafer is damaged.

22. A semiconductor manufacturing apparatus,

wherein a plurality of chambers and a transport chamber are mechanically connected to each other; a predetermined number of first chambers of said plurality of chambers have a function to perform a first process to said semiconductor wafer after said semiconductor wafer is transported one by one; a photographing unit for obtaining the flat entire image of said semiconductor wafer to which said first process has been performed in said first chamber is provided in said transport chamber; said semiconductor manufacturing apparatus has a discrimination unit functioning to determine the presence of damages on said semiconductor wafer by taking said flat entire image of said semiconductor wafer and comparing a flat entire image of a good semiconductor wafer recorded in advance with said flat entire image of said semiconductor wafer; and said semiconductor manufacturing apparatus has a function to stop the operation of itself when said discrimination unit determines that said semiconductor wafer is damaged.

23. A semiconductor manufacturing apparatus,

wherein a plurality of chambers and a transport chamber are mechanically connected to each other; a predetermined number of first chambers of said plurality of chambers have a function to apply a heat treatment to a first surface of a semiconductor wafer or to form a first thin film on the first

surface of said semiconductor wafer after transporting said semiconductor wafer one by one; a photographing unit for obtaining the flat entire image of said semiconductor wafer having said first surface to which said heat treatment has
5 been applied or on which said first thin film is formed in said first chamber is provided in said transport chamber; said semiconductor manufacturing apparatus has a discrimination unit functioning to determine whether a position of said heat treatment or that of said first thin film on said first surface is proper or improper by taking said flat entire image of said semiconductor wafer and comparing a flat entire image of a good semiconductor wafer recorded in advance with said flat entire image of said semiconductor wafer; and said semiconductor manufacturing apparatus has a function to stop
10 the operation of itself when said discrimination unit determines that said position of said heat treatment or that of said first thin film on said first surface is displaced from a predetermined position.

24. A semiconductor manufacturing apparatus,
20 wherein a plurality of chambers and a transport chamber are mechanically connected to each other; a predetermined number of first chambers of said plurality of chambers have a function to apply a heat treatment to a first surface of a semiconductor wafer or to form a first thin film on the first
25 surface of said semiconductor wafer after transporting said semiconductor wafer one by one; a photographing unit for obtaining the flat entire image of said semiconductor wafer having said first surface to which said heat treatment has

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been applied or on which said first thin film has been formed
in said first chamber is provided in said transport chamber;
said semiconductor manufacturing apparatus has a
discrimination unit functioning to determine whether or not
5 said heat treatment is applied or whether or not said first
thin film is formed on said first surface of said
semiconductor wafer by taking said flat entire image of said
semiconductor wafer and comparing a flat entire image of a
good semiconductor wafer recorded in advance with said flat
10 entire image of said semiconductor wafer; and said
semiconductor manufacturing apparatus has a function to stop
the operation of itself when said discrimination unit detects
that said heat treatment is not performed or that said first
thin film is not formed on said first surface of said
15 semiconductor wafer.

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